

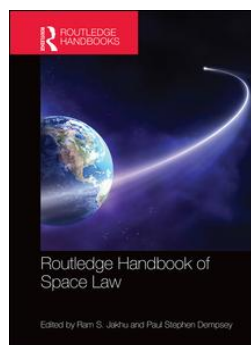
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Legal status of spacecraft

Mark J. Sundahl*

I Introduction

The treatment of spacecraft under international as well as national law presents a number of issues, many of which continue to be a matter of debate. One of the core questions is which state's law applies to the operation of spacecraft. In the course of its flight, a spacecraft will typically cross the borders of multiple countries as it moves through airspace. And if the launch is successful, the spacecraft will leave the atmosphere and enter the extraterritorial realm of outer space. Throughout this journey, it is important to understand what law applies – which domestic law as well as international law – in order to address issues of regulation of the spacecraft, liability questions, and other legal matters. Other issues taken up in this chapter include the extent to which international law applies to private spacecraft, the legal status of multinational space ventures, and whether air law or space law should govern the flight of suborbital winged spaceplanes.

II Jurisdiction over space objects

Jurisdiction is one of the most fundamental questions in the law of outer space – or for any area of law – since jurisdiction determines the applicable law and the courts that enforce that law. This section provides a brief explanation of the different types of jurisdiction and then explains how this issue affects space objects.

Jurisdiction takes three basic forms: (1) prescriptive jurisdiction; (2) enforcement jurisdiction; and (3) adjudicative jurisdiction.¹ Prescriptive jurisdiction is the right of a state to apply its laws in order to regulate persons and activities.² Enforcement jurisdiction refers to a

* The author would like to thank his research assistants, Daniel Copfer and Sarah Sexton, for their valuable contributions to this chapter.

1 Cedric Ryngaert, *Jurisdiction in International Law* (Oxford: Oxford University Press, 2008) at 9. See also W Michael Reisman, ed, *Jurisdiction in International Law* (Brookfield, VT: Ashgate/Dartmouth, 1999).

2 Ryngaert, *supra* note 1 at 9, citing *Restatement (Third) of US Foreign Relations Law* §401(a) (1987). Under customary international law, a State has prescriptive jurisdiction if one of the bases of jurisdiction is present. The bases of prescriptive jurisdiction are: (1) territoriality; (2) nationality; (3) effects; (4) national security; (5) passive personality; and (6) universality. Kal Raustiala, "The Geography of Justice" (2004–2005) 73:6 Fordham L Rev 2501 at 2512.

state's right to enforce (or punish non-compliance with) its laws.³ Adjudicative jurisdiction is the right of a state's courts to subject persons or things to their adjudicative processes and issue a ruling on a matter.⁴

Another way to conceive of the different types of jurisdiction is to distinguish between “jurisdiction” and “jurisdiction”. Jurisdiction describes the normative element of a state's jurisdiction which entitles a state to “make laws or take decisions, including judicial decisions, with legally binding effect”.⁵ Jurisdiction, in contrast, represents “the concrete element of state jurisdiction which enables a state...to implement and to enforce its laws and decisions”.⁶

Jurisdiction can also be “exclusive” or “concurrent”. Exclusive jurisdiction exists when a court has sole jurisdiction over a matter and no other court is able to assert its jurisdiction. In contrast, concurrent jurisdiction describes the situation where multiple courts are able to assert their jurisdiction over the same matter.

With this background in mind, the following sections explain how matters of jurisdiction are handled with respect to spacecraft.

A. State of registration to maintain jurisdiction and control

Article VIII of the Outer Space Treaty explicitly grants jurisdiction over a space object to the object's state of registry:

A state party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body.⁷

Pursuant to the Registration Convention, when a space object is launched into space, the launching state is required to record the launch in its national registry (as well as provide information about the object to the Secretary-General of the United Nations (UN) to be included in the international register).⁸ It is this state of registry that then has “jurisdiction and control” over the object under Article VIII of the Outer Space Treaty.

One interpretation of Article VIII is that the state of registry has exclusive jurisdiction to regulate the space object, personnel thereof, and any related disputes.⁹ However, the concept of “jurisdiction” in Article VIII can be more narrowly read at least in two respects. First, Article VIII can be narrowly interpreted as only granting *prescriptive* jurisdiction to the state of registry

³ Ryngaert, *supra* note 1 at 9.

⁴ *Ibid.* at 10.

⁵ Bin Cheng, *Studies in International Space Law* (New York: Oxford University Press, 1997) at 480.

⁶ *Ibid.*

⁷ *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies*, 27 January 1967, 610 UNTS 205, art VIII [*Outer Space Treaty*].

⁸ *Convention on Registration of Objects Launched into Outer Space*, 14 January 1975, 1023 UNTS 15, art II [*Registration Convention*].

⁹ See e.g. Setsuko Aoki, “In Search of the Current Legal Status of the Registration of Space Objects” in *54th Proceedings of the International Institute of Space Law* (The Hague: Eleven International Publishing, 2011) 245 at 248 (“[j]urisdiction arising from the registration shall be comprehensive, and a State of registry is supposed to hold legislative, judicial and, above all, enforcement jurisdiction”). See also Michael Chatzipanagiotis, *The Legal Status of Space Tourists in the Framework of Commercial Suborbital Flights* (Koln: Carl Heymanns Verlag, 2011) at 48.

over a space object.¹⁰ This would make sense in light of the concept that the state of registry “shall retain jurisdiction and control”. It could be argued that Article VIII does not address enforcement or adjudicative jurisdiction.¹¹ Second, even if Article VIII is read as granting jurisdiction of every form to the state of registry, it can be interpreted as a non-exclusive grant of jurisdiction – thus enabling other states to assert jurisdiction when appropriate under other law.¹² For example, customary international law permits a state to exercise prescriptive jurisdiction if any of the five bases of prescriptive jurisdiction exists (i.e. Territory, nationality, effect, national security, and passive personality).¹³ Moreover, Article VI of the Outer Space Treaty suggests that any grant of jurisdiction under Article VIII is non-exclusive,¹⁴ since the duty to supervise national activity under Article VI presupposes that a state retains jurisdiction over the space objects of one’s nationals (even if it is not the state of registry).¹⁵

Article VIII grants jurisdiction not only over the space object but also over any “personnel thereof”.¹⁶ This jurisdiction over personnel would conceivably continue when a person leaves the spacecraft, such as during extra-vehicular activity (i.e. a “spacewalk”) or when exploring a celestial body outside of the landing craft. A more difficult question is whether the jurisdiction of an astronaut from one flight element of the International Space Station would continue when the astronaut enters a flight element registered by another state. This is discussed in greater detail below in [section V](#).¹⁷

A state’s jurisdiction cannot be easily determined where a space object has not been registered by any state. In such a case, it would be necessary to fall back again onto the customary international law of prescriptive jurisdiction. Under customary law, a state may have the jurisdiction to regulate a space object if:

- (1) the object was launched from its territory (territorial jurisdiction);
- (2) the object was under the control of its nationals (nationality jurisdiction);
- (3) the operation of the object had significant effects on the state (e.g., media broadcasting) (effects jurisdiction); or
- (4) the object posed a security threat to a state (national security jurisdiction).

This situation may arise in the case of suborbital spacecraft where the Registration Convention will likely not require registration, since the duty to register only applies to space objects

¹⁰ Stephan Hobe *et al.*, eds, *Cologne Commentary on Space Law* (Koln: Heymanns, 2009) vol 1 at 159 (“[t]he legal consequence of jurisdiction and control is the applicability of the national law of the State of registry for the object launched into outer space”).

¹¹ See e.g. Paul Larsen, “UNIDROIT Space Protocol: Comments on the Relationship between the Protocol and Existing International Space Law” in American Institute of Aeronautics and Astronautics, International Institute of Space Law & International Astronautical Federation, eds, *Proceedings of the Forty-Fourth Colloquium on the Law of Outer Space, 1 October–5 October, 2001, Toulouse, France* (Reston, VA: American Institute of Aeronautics and Astronautics, 2002) 187 at 191 (“Outer Space Treaty is not intended to cover the issue of jurisdiction of national courts”).

¹² Chatzipanagiotis, *supra* note 9 at 50 (“[i]t has been accepted that the State of registry does not have exclusive jurisdiction”).

¹³ Kal Raustiala, “The Geography of Justice” (2005) 73 Fordham L. R. 2501, 2512.

¹⁴ See *Outer Space Treaty*, *supra* note 7, art VI.

¹⁵ Hobe *et al.*, *supra* note 10 at 113 (“a State has jurisdiction over any activity that is carried on from its territory as well as over any activity that is carried on by its nationals”). Regarding the duty to authorize and supervise national space activity, see [section III](#), below.

¹⁶ *Outer Space Treaty*, *supra* note 7, art XIII.

¹⁷ See [section V](#), below.

launched into “earth orbit or beyond”.¹⁸ Suborbital vehicles would seem to be outside this scope and, therefore, the question of jurisdiction would have to be resolved under laws other than the space treaties.

B. The effect of transfer of ownership on jurisdiction

The plain language of Article VIII of the Outer Space Treaty implies that jurisdiction remains with the state of registry even after the transfer of the object to another state. The issue arises when the rule of jurisdiction and control under Article VIII faces the reality of commercial space where changes in ownership and control of a space object take place on a fairly regular basis.¹⁹

Article VIII of the Outer Space Treaty simply assigns “jurisdiction and control” of a space object to the state of registry. The treaty does not provide for any change in this assignment of jurisdiction and control, but contemplates that it will perpetually remain with the original state of registry. While this approach made sense during an age when space objects were only launched by states and the objects were not the subject of subsequent commercial transactions, which would result in the transfer of ownership and actual control to a new party, the current realities of commercial space use have revealed the flaws in the rule under Article VIII. Although it is appropriate for the launching state to have jurisdiction and control over a satellite that it has put into orbit and is operating, it no longer makes sense for the original state of registry to retain jurisdiction and control once this satellite has been transferred to another state. Instead, the transferee state should be granted jurisdiction and be required to exercise control, since this would reflect the reality that the new owner has *de facto* control of the satellite.²⁰ The transferee state should also have prescriptive jurisdiction under customary international law to regulate the operation of the acquired satellite.

One solution to the problem of jurisdiction remaining with the state of registry following a transfer is to have the state of registry enter into an agreement with the transferee state granting the latter jurisdiction over the satellite.²¹ Such agreements are expressly permitted under Article II of the Registration Convention in order to transfer jurisdiction between launching states, but there is nothing preventing a non-launching state from accepting jurisdiction under such an agreement.²²

¹⁸ *Registration Convention*, *supra* note 8, art II. One commentator argues that suborbital spaceplanes would only be exempt from registration if the activity took place entirely within a single country, but that if international borders were crossed, registration would be required. See Frans G von der Dunk, “Beyond What? Beyond Earth Orbit?...!: The Applicability of the Registration Convention to Private Commercial Manned Sub-Orbital Spaceflight” (2012–2013) 43:2 *Cal W Intl LJ* 269 at 340.

¹⁹ See e.g. Michael Chatzipanagiotis, “Registration of Space Objects and Transfer of Ownership in Orbit” (2007) 56:2 *ZLW* 229 at 230; Julian Hermida, “Transfer of Satellites in Orbit: An International Law Approach” in American Institute of Aeronautics and Astronautics, International Institute of Space Law & International Astronautical Federation, eds, *Proceedings of the Forty-Sixth Colloquium on the Law of Outer Space: 29 September–3 October, Bremen, Germany* (Reston, VA: American Institute of Aeronautics and Astronautics, 2004) 189 at 190. Examples of the transfer of on-orbit satellite include (1) the sale by Telesat Canada of the Anik CI and Anik CII satellites to the Argentine corporation Paracomat S.A. (2) the sale of the satellite BSB-1A by the United Kingdom to the Swedish company Nordic Satellite AB, and (3) the taking of title by Lloyds of the Indonesian Palapa B satellite following the payment of insurance proceeds to the insured and the subsequent sale of the satellite to a new operator. See Larsen, *supra* note 11 at 190.

²⁰ Chatzipanagiotis, *supra* note 19, at 230; Hermida, *supra* note 19 at 190.

²¹ Hermida, *supra* note 19 at 190.

²² *Registration Convention*, *supra* note 8, art II.

Another way of transferring “jurisdiction and control” to the transferee state is for the original state of registry to deregister the space object by removing it from its domestic registry.²³ Although such “de-registration” is not mentioned in the space treaties, there is nothing in the treaties that prohibits such practice.²⁴ This de-registration is followed by the registration of the object by the transferee state, which would result in the jurisdiction and control being attached to the new state of registry. An example of this process took place in 1997 when four satellites (AsiaSat-1, AsiaSat-2, APSTAR-I, and APSTAR-IA) previously carried on the United Kingdom (UK) registry were deregistered and then subsequently registered by China.²⁵

III Authorization and continuing supervision by the appropriate state party

Separate from the grant of jurisdiction to the state of registry under Article VIII of the Outer Space Treaty is the duty prescribed under Article VI of the Treaty that all “non-governmental” space activities “require authorization and continuing supervision by the appropriate state party to the Treaty”.²⁶ This duty follows another provision in Article VI which imposes on states “international responsibility for national activities in outer space ... whether such activities are carried on by governmental agencies or by non-governmental entities”.²⁷ Some interpret the duty to “authorize and continually supervise” non-governmental space activity as only clarifying the international responsibility imposed earlier in Article VI by making explicit that this responsibility entails the duty to authorize and supervise the state’s national activity.²⁸ Others see it as a separate imposition of responsibility on a new category of states that qualify as the “appropriate states”.²⁹ Some scholars have posited that only a “launching state” or the state of nationality of the actor should qualify as an “appropriate state”.³⁰ However, others have

23 Armel Kerrest, “Remarks on the Notion of the Launching State” in American Institute of Aeronautics and Astronautics & International Institute of Space Law, eds, *Proceedings of the Forty-Second Colloquium on the Law of Outer Space: 4–8 October 1999, Amsterdam, the Netherlands* (Reston, VA: American Institute of Aeronautics and Astronautics, 2000) 308 at 308–09.

24 Ricky J Lee, “Effects of Satellite Ownership Transfers on the Liability of the Launching States” in International Institute of Space Law, ed, *Proceedings of the Forty-Third Colloquium on the Law of Outer Space: 2 October–6 October 2000, Rio de Janeiro, Brazil* (Reston, VA: American Institute of Aeronautics and Astronautics, 2001) 148 at 153.

25 To view information regarding these registrations, see UN, Office for Outer Space Affairs, “Online Index of Objects Launched into Outer Space”, online: UNOOSA [www.unoosa.org/oosa/osoindex/search-ng.jsp?lf_id=\[UNOOSA, “Online Index”\]](http://www.unoosa.org/oosa/osoindex/search-ng.jsp?lf_id=[UNOOSA, “Online Index”]). The index provides links to the following registration documents: ST/SG/SER.E/333 (April 3, 1998); ST/SG/SER.E/334 (April 3, 1998); and ST/SG/SER.E/475 (November 16, 2005). See also Francis Lyall & Paul B Larsen, *Space Law: A Treatise* (Burlington, VT: Ashgate Publishing, 2009) at 92–93.

26 *Outer Space Treaty*, *supra* note 7, art VI.

27 *Ibid.*

28 Hobe *et al.*, *supra* note 10 at 111.

29 For a thorough discussion of this issue, see Joyeeta Chatterjee, “Reflections on the Concepts of ‘Liability’ and ‘Jurisdiction’ in a Privatised Atmosphere” in Mark J Sundahl & V Gopalakrishnan, eds, *New Perspectives on Space Law: Proceedings of the 53rd IISL Colloquium on the Law of Outer Space, Young Scholars Sessions* (The Hague: Eleven International Publishing, 2011), at 194–97.

30 See e.g. Stephen Gorove, “Liability in Space Law: An Overview” (1983) 8 Ann Air & Sp L 377; Vladlen Vereshchetin, “Space Activities of ‘Nongovernmental Entities’: Issues of International and Domestic Law” in International Institute of Space Law, International Astronautical Federation & American Institute of Aeronautics and Astronautics, eds, *Proceedings of the Twenty-Sixth Colloquium on the Law of Outer Space, October 10–15, 1983, Budapest, Hungary* (New York: American Institute of Aeronautics and Astronautics, 1984) 261.

argued that the term “appropriate state” must, due to its vague nature, be interpreted broadly to potentially include any state that has jurisdiction over the particular space activity (however such jurisdiction arises) or is substantially involved in the operation or control of the space object.³¹ It is this duty to “authorize and continually supervise” that requires states to enact appropriate regulatory regimes governing space activity. Examples of such regulations are described below in the section on spaceplanes.

IV The application of international law to private spacecraft

The extension of international treaty obligations to privately-owned spacecraft is difficult to deny. As a starting point, Article VI of the Outer Space Treaty extends the application of the Treaty to private space operations by requiring that states supervise the space activity of *non-governmental entities* and bear responsibility for any failure of non-governmental entities to comply with the Treaty.³² It also makes good policy to require that all space activity (even if private) observe the duties and obligations that were written into the UN space treaties. As private activities expand, it will become ever more important that these rules are observed by private actors. That said, it is a fundamental rule that private actors are not subject to international law *per se*, so it will fall on states to enact domestic regulations that require private actors to comply with international law.

One widely observed state practice that supports the extension of the international treaties to private activity is the registration of privately-owned satellites by its launching state under the Registration Convention.³³ Similarly, a state is liable for any damage caused by space objects it launches under the Liability Convention whether such objects are owned by the government or a private entity.³⁴ Finally, a majority of commentators agree to extend to commercial actors the benefits of the duty to rescue personnel and return errant private spacecraft under the Rescue Agreement.³⁵ The duty to rescue personnel and return spacecraft would seem to apply

31 See e.g. William B Wirin, “Practical Implications of Launching State – Appropriate State Definitions” in American Institute of Aeronautics and Astronautics, International Institute of Space Law & International Astronautical Federation, eds, *Proceedings of the Thirty-Seventh Colloquium on the Law of Outer Space: October 9–14, 1994, Jerusalem, Israel* (Washington, DC: American Institute of Aeronautics and Astronautics, 1995) 113; Armel Kerrest, “Remarks on the Responsibility and Liability for Damage Caused by Private Activity in Outer Space” in American Institute of Aeronautics and Astronautics & International Institute of Space Law, eds, *Proceedings of the Forty-Second Colloquium on the Law of Outer Space: 4–8 October 1999, Amsterdam, the Netherlands* (Reston, VA: American Institute of Aeronautics and Astronautics, 2000) 139.

32 *Outer Space Treaty*, *supra* note 7, art VI.

33 *Registration Convention*, *supra* note 8, art I. See also UN, Committee on the Peaceful Uses of Outer Space, *Practice of States and International Organizations in Registering Space Objects: Replies from Member States*, UNGAOR, 2004, UN Doc A/AC.105/C.2/L.250/Add.1 (France “registers national satellites, whether they belong to government organizations or private companies” at 3).

34 *Convention on the International Liability for Damage Caused by Space Objects*, 29 March 1972, 961 UNTS 187 [*Liability Convention*]. Regarding the liability of launching States for harm caused by commercial ventures, see Bruce A Hurwitz, “Liability for Private Commercial Activities in Outer Space” in International Institute of Space Law, ed, *Proceedings of the Thirty-Third Colloquium on the Law of Outer Space, October 6–12, 1990, Dresden, Germany* (Washington, DC: American Institute of Aeronautics and Astronautics, 1991) 37 at 39; Ricky J Lee, “Reconciling International Space Law with the Commercial Realities of the Twenty-First Century” (2000) 4 *Sing JICL* 194 at 230.

35 *Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space*, 22 April 1968, 672 UNTS 119 [*Rescue Agreement*]. See e.g. IHPH Diederiks-Verschoor & W Paul Gormley, “The Future Legal Status of Nongovernmental Entities in Outer Space: Private

to commercial ventures, since nothing in the text of either the Outer Space Treaty or the Rescue Agreement explicitly excludes commercial venture or limits the scope of the duties to government-sponsored missions. An example of this can be found in Article 2 of the Rescue Agreement:

If, owing to accident, distress, emergency or unintended landing, the personnel of a spacecraft land in territory under the jurisdiction of a Contracting Party, it shall immediately take all possible steps to rescue them and render them all necessary assistance.³⁶

None of the terms in the Rescue Agreement excludes commercial enterprises in their ordinary meaning – in fact, the term “personnel” (as is used in Article 2) is typically used in a commercial context (e.g., cruise ship personnel) as well as in government contexts.³⁷ This lack of any distinction between private and public spaceflight in the plain language of the Rescue Agreement supports a broad interpretation which would require states to rescue non-governmental personnel and return private spacecraft. Moreover, there have been at least seven instances of space objects being found on Earth resulting in the notification of the UN Secretary-General and the return of the assets to the launching authority as is required under the Rescue Agreement.³⁸ At least two of these incidents involve the recovery of private spacecraft. Specifically, the governments of Argentina and South Africa, in 2000 and 2004, respectively, notified the UN Secretary-General of the discovery and planned return to the United States (US) of space objects that had been found in their respective territories.³⁹ In both cases, the governments had determined prior to giving notification that the space objects were parts of Delta II launch vehicles which – although they delivered government payloads – were owned by a private company, namely the Boeing Company.

V The legal status of multinational space objects

Although most satellites and other space objects are typically subject to the jurisdiction and control of a single state, this general rule can be complicated by space objects that involve the

Individuals and Companies as Subjects and Beneficiaries of International Space Law” (1977) 5:1&2 J Space L 125 at 155; Frans G von der Dunk, “Space for Tourism? Legal Aspects of Private Spaceflight for Tourist Purposes” in American Institute of Aeronautics and Astronautics & International Institute of Space Law, eds, *Proceedings of the Forty-Ninth Colloquium on the Law of Outer Space: 2–6 October 2006, Valencia, Spain* (Washington, DC: American Institute of Aeronautics and Astronautics, 2007).

³⁶ *Registration Convention*, *supra* note 8, art II.

³⁷ One example of the use of the term “personnel” to refer to employees can be found in the name of the US Office of Personnel Management (OPM) which oversees the federal workforce. See the OPM website at www.opm.gov.

³⁸ Descriptions of these instances of privately-owned space objects being found are provided in Frans G von der Dunk, “A Sleeping Beauty Awakens: The 1968 Rescue Agreement after Forty Years” (2008) 34:2 J Space L 411 at 426–31.

³⁹ UN, Office for Outer Space Affairs, *Note verbale dated 23 March 2004 from the Permanent Mission of Argentina to the United Nations (Vienna) addressed to the Director-General of the United Nations Office at Vienna*, UN Doc A/AC.105/825, 2004, online: UNOOSA www.unoosa.org/oosa/ooasadoc/data/documents/2004/aac.105/aac.105825_0.html; UN, Office for Outer Space Affairs, *Note verbale dated 3 July 2000 from the Permanent Mission of the Republic of South Africa to the United Nations (Vienna) addressed to the Secretary General*, UN Doc A/AC.105/740, 2000, online: UNOOSA www.unoosa.org/oosa/ooasadoc/data/documents/2000/aac.105/aac.105740_0.html.

participation of multiple states (or their nationals). For example, spacecraft may be constructed out of components manufactured in different states. The construction and launch of a space object may also be a joint venture of multiple companies from different states. Legal obligations may also be shared by multiple states at the same time, which is the case under the Liability Convention which imposes several and joint liability on all “launching states” – a term that captures not only the state that launches (or procures the launch of) the object, but also the state from whose territory or facility an object is launched.⁴⁰

The following sections examine how particular issues in international space law are raised by two multinational ventures: the International Space Station and Sea Launch, the launch service provider.

A. *The international space station*

The International Space Station (ISS) is the greatest example of international cooperation in outer space. The first module (or “flight element”) was placed in orbit in 1998 by Russia and since then numerous other flight elements or other equipment have been contributed by the partner states, namely the US, Canada, Japan, and eleven member states of the European Space Agency (ESA) (Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, Spain, Sweden, the UK, and Switzerland).⁴¹ Astronauts (and occasionally space tourists) move between the different flight elements as they conduct science and carry out other activities.

The operation of the ISS is governed by the Intergovernmental Agreement on the International Space Station (IGA) which addresses a number of legal topics, such as civil and criminal jurisdiction, intellectual property, and the operational responsibilities of the partner states.⁴² The jurisdiction provisions of the IGA are most relevant to the question of legal status and is the focus of this section.

Article 5 of the IGA provides that “each Partner shall register as space objects the flight elements ... which it provides” according to Article II of the Registration Convention.⁴³ To date, different flight elements have been registered by the US, Russia, Japan, and the ESA.⁴⁴ Article 5 goes on to state that “[p]ursuant to Article VIII of the Outer Space Treaty and Article II of the Registration Convention, each Partner shall retain jurisdiction and control over the elements it registers ...”⁴⁵ While this portion of Article 5 grants jurisdiction over registered space objects in the same way as the Registration Convention, the jurisdiction over personnel is slightly different under the IGA. Whereas the Registration Convention grants jurisdiction over the space object

⁴⁰ *Liability Convention*, *supra* note 34, arts I, V(1).

⁴¹ For more information on the International Space Station, see US, National Aeronautics and Space Administration, “International Space Station”, online: NASA www.nasa.gov/mission_pages/station/main/index.html.

⁴² *Agreement among the Government of Canada, Governments of Member States of the European Space Agency, the Government of Japan, the Government of the Russian Federation, and the Government of the United States of America concerning Cooperation on the Civil International Space Station*, 29 January 1998, TIAS No. 12927 [IGA].

⁴³ IGA, *ibid.*, art 5(1).

⁴⁴ Modules and who registered it based on the UN registry: Zarya (US), Unity (US), Zvezda (Russia), Destiny (US), Quest (US), Pirs (Russia), Poisk (Russia), Harmony (US), Tranquility (US), Columbus (ESA), Kibo (Japan), Cupola (US), Rassvet (Russia), and Leonardo (US). See US, National Aeronautics and Space Administration, “International Space Station: Space Station Assembly”, online: NASA www.nasa.gov/mission_pages/station/structure/elements/mplm.html.

⁴⁵ IGA, *supra* note 42, art 5(2).

and the “personnel thereof”, the IGA grants jurisdiction to the partner states over their nationals wherever they are “in or on the Space Station”.⁴⁶ Therefore, a state retains jurisdiction over their nationals even when their nationals are in a flight element registered by another state.

The foregoing jurisdictional rules are modified with respect to criminal jurisdiction. Under Article 22 of the IGA, primary jurisdiction to prosecute an astronaut who has committed a crime on board the ISS and is a national of Canada, Japan, Russia, the US, or one of the European partner states is granted to that state of nationality.⁴⁷ Secondary jurisdiction to prosecute the perpetrator is granted to both (1) the state of the victim, and (2) the state that owns the flight element where the crime took place (or where criminal damage occurred to the flight element).⁴⁸ This secondary jurisdiction is triggered if the state of the perpetrator’s nationality (1) agrees to allow the other state to prosecute or (2) fails to provide adequate assurance that it will prosecute.⁴⁹ For example, if a Japanese astronaut commits a crime of violence against a Russian astronaut in a flight element registered by the US, Japan would have jurisdiction to prosecute the perpetrator. However, if Japan either agrees to the jurisdiction of Russia or the US or fails to provide assurance that it will prosecute, either Russia or the US could prosecute the Japanese astronaut.⁵⁰

Special jurisdictional provisions are also provided with respect to intellectual property.⁵¹ The core jurisdictional provision regarding the application of intellectual property law is set forth in Article 21(2), which states that, “for purposes of intellectual property law, an activity occurring in or on a Space Station flight element shall be deemed to have occurred only in the territory of the partner state of that element’s registry”.⁵² This provision returns to the basic rule of the Outer Space Treaty that the jurisdiction of the state of registry applies to each separate flight element. This has the effect of ensuring that discoveries and inventions will be protected by the intellectual property law of the state of registry, while also limiting the applicable law to that of the state of registry.⁵³ If a discovery or invention occurs in an ESA-registered flight element, any of the ESA partner states may apply its intellectual property laws.⁵⁴ However, the holder of any such intellectual property rights may only recover damages for infringement in one ESA partner state.⁵⁵

B. Sea Launch: an example of a multinational private enterprise

Sea Launch is a multinational corporation founded in 1999 that offers launch services. The company was originally composed of five companies: a US company (Boeing), a Russian

⁴⁶ Ibid.

⁴⁷ Ibid., art 22(1). This list includes those States that have registered flight elements.

⁴⁸ Ibid., art 22(2).

⁴⁹ Ibid.

⁵⁰ For a thorough treatment of criminal jurisdiction on the ISS and references to writings on the topic, see Michael Chatzipanagiotis & Rafael Moro-Aguilar, “Criminal Jurisdiction in International Space Law: Future Challenges in View of the ISS IGA” in International Institute of Space Law, ed, *Proceedings of the International Institute of Space Law* (forthcoming 2015). See also PJ Blount, “Jurisdiction in Outer Space: Challenges of Private Individuals in Space” (2007) 33:2 J Space L 299 at 312–13.

⁵¹ See IGA, *supra* note 42, art 21.

⁵² Ibid., art 21(2).

⁵³ Rochus Moenter, “The International Space Station: Legal Framework and Current Status” (1998–1999) 64:4 J Air L & Com 1033 at 1053.

⁵⁴ IGA, *supra* note 42, art 21(2).

⁵⁵ Ibid., art 21(4).

company (Energia), two Ukrainian companies, and a Norwegian company.⁵⁶ Sea Launch filed for Chapter 11 bankruptcy reorganization in 2010 during which Energia gained 95 percent of the interest.⁵⁷ This left only 2.5 percent of the company equity for both Boeing and the Norwegian company. Sea Launch has its corporate headquarters in Switzerland and is incorporated in the Cayman Islands.⁵⁸ The company has two main pieces of equipment: the Odyssey Launch Platform (a converted oil rig where the launches occur), and an Assembly and Command Ship (where rocket and payload are assembled and transported).⁵⁹ Sea Launch's homeport is in Long Beach California, where the platform and the Command Ship are docked.⁶⁰

What makes Sea Launch unique is that its launches take place on the high seas in the Pacific Ocean near the Equator.⁶¹ Unlike every other launch site in the world, the Odyssey is not on a state's territory at the time of launch. Launching from the high seas raises the question of what state is a "launching state" for the purpose of allowing for registration of the space objects launched by Sea Launch as well as for the purpose of assigning liability under the Liability Convention. Similarly, launching from non-sovereign territory, such as the high seas, complicates the question of what the "launching authority" is for purposes of returning any lost space objects to the launching authority pursuant to the Rescue Agreement.

The jurisdiction and control over space objects launched by Sea Launch is granted to the state of registration under the Registration Convention.⁶² Pursuant to the Convention, only a "launching state" can register a space object. This is where the launching of objects from the high seas creates special issues. Because the high seas are not subject to the sovereignty of any state, there is no launching state on the basis of territory of the launch site. When Sea Launch launches an object, a state can only be deemed a launching state if it can be said to (1) have launched the object, (2) have procured the launch, or (3) own the facility from which the launch takes place.⁶³ Pursuant to these criteria, there are a number of theories for which states would qualify as a launching state.

- Russia could qualify as a launching state under the theory that it owns the facility from which the launches take place since the Russian company Energia owns 95 percent of Sea Launch.⁶⁴ In contrast, the US is unlikely to be a launching state under this theory, since

⁵⁶ See Armel Kerrest, "Launching Spacecraft from the Sea and the Outer Space Treaty: The Sea Launch Project" (1998) 23:1 Air & Space L 16. To learn more about the Sea Launch, see online: Sea Launch www.sea-launch.com.

⁵⁷ Regarding the Sea Launch bankruptcy filing, see Sea Launch, News Release, "Sea Launch Company Emerges From Chapter 11" (27 October 2010), online: Sea Launch web.archive.org/web/20110927163423/www.sea-launch.com/news_releases/2010/nr_101027.html. Regarding the percentage of ownership, see Nate Raymond, "Boeing Sues Sea Launch Partners for \$350 Million", *Reuters* (4 February 2013), online: Reuters www.reuters.com/article/2013/02/04/us-boeing-sealaunch-idUSBRE9130RU20130204.

⁵⁸ See Sea Launch, "About Sea Launch", online: Sea Launch www.sea-launch.com/about; Kerrest, *supra* note 56 at 16.

⁵⁹ See *ibid.*

⁶⁰ See *ibid.*

⁶¹ See Kerrest, *supra* note 56, and Armel Kerrest, "Launching Spacecraft from the Sea and the Outer Space Treaty: The Sea Launch Project," in (1997) *Proceedings of the 40th Colloquium on the Law of Outer Space* 264.

⁶² See section II, above.

⁶³ *Registration Convention*, *supra* note 8, art I.

⁶⁴ Kerrest, *supra* note 56 at 18.

Boeing, an entity organized in the US, owns only 2.5 percent of the company, thus lacking substantial control over the launch facility.⁶⁵

- The UK might also qualify as a launching state under the theory that it owns the launch facility, since Sea Launch is incorporated in the Cayman Islands, a British Crown Colony.⁶⁶
- Under the theory of procuring the launch, any state that (or state whose company) contracts for Sea Launch's launch services could be treated as a launching state.⁶⁷

A search of the UN Online Index of Objects Launched into Outer Space shows that a number of states have registered satellites placed into orbit by Sea Launch, including the US, Brazil, Japan, and Italy. A state will typically register those satellites that it owns and has procured the launch of them, or those satellites owned by a company of its nationality.⁶⁸ The US has asserted jurisdiction over Sea Launch by licensing all of its launches through the Office of Commercial Space Transportation (AST) of the Federal Aviation Administration (FAA), both before and after its reorganization in 2010.⁶⁹

The Liability Convention imposes liability for damage caused by a space object on the "launching state" (or launching states).⁷⁰ The definition of "launching state" in the Liability Convention is the same as in the Registration Convention – and, therefore, the analysis of which state qualifies as a launching state for the purposes of assigning liability would follow the same analysis described above.⁷¹

Pursuant to the Rescue Agreement, in the event of an unintended landing of a space object, the object and any astronauts on board must be returned to the "launching authority".⁷² The "launching authority" is defined as the state that is "responsible for launching" the object.⁷³ The problem with this definition is that a state may not qualify as being "responsible for launching" a space object when the space venture is private in nature (such as Sea Launch). The analysis is further complicated if a launch takes place in non-sovereign territory, such as the high seas. One straightforward solution would be to require the return of a state-owned space object (such as a surveillance satellite) to that state. Likewise, a private space object should be returned to the state where the company is incorporated.

VI Spaceplanes

There are a number of suborbital spaceplanes under development by private companies that will soon be flying passengers, science experiments, and other cargo into suborbital space. The leading companies in this field (with the name of their spacecraft in parentheses) are Virgin Galactic (SpaceShipTwo), XCOR (Lynx), and Swiss Space Systems (SOAR). As the technology

⁶⁵ Ibid.

⁶⁶ Ibid.

⁶⁷ Ibid. at 19. See also Kai-Uwe Schrogl & Charles Davies, "A New Look at the 'Launching State': The Results of the UNCOPUOS Legal Subcommittee Working Group "Review of the Concept of the Launching State" 2000–2002" in International Institute of Space Law, ed, *Proceedings of the Forty-Fifth Colloquium on the Law of Outer Space, 10 October–19 October 2002, Houston, Texas* (Reston, VA: American Institute of Aeronautics and Astronautics, 2003) 386.

⁶⁸ See UNOOSA, "Online Index", *supra* note 25.

⁶⁹ See US, Federal Aviation Administration, "Data & Research: Launches", online: US Federal Aviation Administration www.faa.gov/data_research/commercial_space_data/launches/?type=Licensed.

⁷⁰ *Liability Convention*, *supra* note 34, arts II, III.

⁷¹ Ibid., art I.

⁷² *Rescue Agreement*, *supra* note 35, arts 4, 5(3).

⁷³ Ibid., art 6.

for this new generation of spacecraft is developed, the legal status of these vehicles is a matter of considerable debate. One question is whether these winged spacecraft that take off and land like airplanes should be subject to international air law or to the law of outer space. Individual states are also struggling with this question on the domestic level, namely whether these spacecraft should be regulated under existing aviation laws or under new laws specifically designed for this new type of space vehicle.

A. Air law vs. space law

Spaceplanes, such as Virgin Galactic's SpaceShipTwo or XCOR's Lynx, traverse airspace on the way to (and when returning from) their apogee at approximately 65 miles (or 105 kilometers) above the Earth.⁷⁴ The preliminary legal question regarding such vehicles is whether they should be governed by air law or by space law – or by both. This question has multiple facets. Nonetheless, the initial question is whether a spaceplane that reaches an apogee of 65 miles has entered outer space at all. If not, it is clear that air law should apply. This raises the long-debated question regarding where outer space begins. Two theoretical approaches in determining whether a spaceplane is an aircraft or a space object have also been applied to resolve the question of air law versus space law: the *spatialist* approach and the *functionalist* approach. The following sections explore these questions and theories.

1 The delimitation of outer space under customary international law

In many cases, the answer to the question of whether an object is in outer space will be clear. For example, satellites being sent into orbit will undeniably operate in outer space and will, therefore, qualify as space assets. The more difficult question will involve equipment that is operating on the border of outer space. For example, a court could in good faith raise the question whether a suborbital spaceplane that reaches a maximum altitude of 105 kilometers (just above the von Kármán line, which lies approximately 100 kilometers above the Earth and is widely viewed as the limit of airspace) is a space asset.⁷⁵ The same question could be raised with respect to a spaceplane that reaches an altitude of ninety-five kilometers – just short of the von Kármán line.

None of the existing space treaties provide any useful guidance regarding the delimitation of outer space. Although the Outer Space Treaty clearly contemplates its application to activities on the Moon and other celestial bodies, to objects launched into outer space, and to objects placed into orbit around the Earth, the treaty does not explicitly define where “outer space” begins.⁷⁶ Both the Liability Convention and the Registration Convention define space object as the “component parts of a space object as well as its launch vehicle and parts thereof.”⁷⁷ However, the definition only clarifies that “space object” includes its launch vehicle and components. The treaties do not establish the limit of outer space.⁷⁸

⁷⁴ See the Virgin Galactic website at www.virgingalactic.com/human-spaceflight/your-flight-to-space and the XCOR website at spaceexpeditions.xcor.com/the-spaceflight.

⁷⁵ See Hobe *et al.*, *supra* note 10 (The “von Kármán line”, which bears the name of the Hungarian aerospace engineer Theodore von Kármán, is that point at the edge of the Earth's atmosphere “where aerodynamic lift is exceeded by centrifugal force” at 31).

⁷⁶ See *Outer Space Treaty*, *supra* note 7, arts I, II, IV, VII, VIII.

⁷⁷ *Liability Convention*, *supra* note 34, art I(d); *Registration Convention*, *supra* note 8, art I(d).

⁷⁸ See *Ibid.*

In the absence of any helpful treaty law, one could look for customary international law regarding the delimitation of outer space. Nonetheless, there is likely not sufficient state practice (or other evidence of customary law) at this point to clearly support an assertion that customary international law exists regarding the boundary of air space and outer space. If a customary international law on this issue were to come into being, the evidence suggests that it will define the boundary of outer space as (or near) the von Kármán line. Evidence of state practice in support of this conclusion can be found in Australian law which suggests that the boundary of outer space lies at 100 kilometers, since the law requires a license only for the launch of space objects above that elevation.⁷⁹ In addition, South African law establishes the border of outer space by defining outer space as “the space above the surface of the earth from a height of which it is in practice possible to operate an object in an orbit around the earth”.⁸⁰ This would place the boundary, under optimal circumstances, in the neighborhood of the von Kármán line. Further support for customary international law may be found in the *Draft Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects*, submitted in 2008 at the UN Conference on Disarmament by China and Russia to ban weapons in outer space. This draft text defines outer space as “space beyond the elevation of approximately 100 km above ocean level of the Earth”.⁸¹ Additionally, the US FAA issued the 2006 Human Space Flight Requirements for Crew and Space Flight Participants (“Human Space Flight Requirements”) pursuant to the Commercial Space Launch Amendments Act of 2004.⁸² Although these regulations do not define outer space, they are intended to cover the operations of suborbital space tourism companies, such as Virgin Galactic, that are acquiring licenses under the regulations in order to fly their vehicles to 100 kilometers. State practice supporting an even lower elevation for the limit of outer space can be found in the regulations of the US Air Force, which grant an astronaut rating to Air Force officers who fly fifty miles above the Earth’s surface.⁸³

Briefly stated, there is evidence in state legislation and state practice that could be used to build support for a customary international law of fixing a boundary of space at approximately 100 kilometers above sea level. However, the amount of evidence may not amount to the level that is required to sustain the existence of customary international law.

2 The spatialist and functionalist theories

The question of whether air law or space law should apply to a spaceplane could also be determined through the application of two theories that distinguish an aircraft from a space object. One approach, known as the *spatialist* theory, is to identify the border of outer space on

79 *Space Activities Act 1998* (Cth), s 8. See Noel Siemon & Steven Freeland, “Regulation of Space Activities in Australia” in Ram S. Jakhu, ed, *National Regulation of Space Activities* (New York: Springer, 2010) 37 at 51.

80 *Space Affairs Act, 1993* (S Afr), No. 84 of 1993, s 1(xv). See also UN, Committee on the Peaceful Uses of Outer Space, *National Legislation and Practice relating to Definition and Delimitation of Outer Space: Replies received from Member States: Australia*, UNGAOR, 2006, UN Doc A/AC.105/865/Add.1.

81 *Draft Treaty on the Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force against Outer Space Objects*, art I(a), online: [UNTERM unterm.un.org/DGAACS/unterm.nsf/0f99a7d734f48ac385256a07005e48fb/b8846544f816abf485257922005c37ee](http://UNTERM.unterm.un.org/DGAACS/unterm.nsf/0f99a7d734f48ac385256a07005e48fb/b8846544f816abf485257922005c37ee).

82 14 CFR Parts 401, 415, 431, 435, 440, 460 (2012); 49 USC §§ 70101–70305 (2011).

83 See US, Air Force, *Air Force Instruction 11–402: Aviation and Parachutist Service, Aeronautical Ratings and Aviation Badges* (5 February 2013) at para 2.3.2, online: [US Air Force static.e-publishing.af.mil/production/1/af_a3_5/publication/afi11-402/afi11-402.pdf](http://USAirForce.static.e-publishing.af.mil/production/1/af_a3_5/publication/afi11-402/afi11-402.pdf).

the basis of the natural properties of space.⁸⁴ The other approach, known as the *functionalist* theory, is to classify an object as a space object on the basis of its function as such object as opposed to an aircraft.⁸⁵

The most widely-supported proposal under the spatialist theory has been to draw the line between airspace and outer space at the von Kármán line.⁸⁶ Among the other possible theories under a spatialist approach are to place the boundary between air space and outer space (1) where there is no longer any atmosphere; (2) where the Earth's gravitational pull is balanced by that of another celestial body (so-called "Lagrange points"); (3) where the lowest possible orbital perigee for a satellite is located; or (4) where the ability of a state to exercise sovereignty ends.⁸⁷

The functionalist approach, though avoids some of the difficulties that come with the spatialist approach, brings its own challenges. Rather than focusing on the identification of a physical boundary between airspace and outer space, the concept behind the functionalist approach is to apply air law to those objects engaged in aviation and apply space law to those objects intended to operate in space.⁸⁸ This test would apply regardless of where the object happened to be physically located at the time a legal claim arose. For example, a satellite being launched into space (along with its launch vehicle) would be treated as a space object even if the launch was aborted and the object never reached space. With respect to spaceplanes, the *functionalist* theory provides potentially greater ambiguity than does the *spatialist* theory, since they operate as aircraft while in the atmosphere, but are also designed to enter outer space. It could be contended that the ultimate function of a spaceplane is to enter outer space and, therefore, it should be treated as a space object. However, others might argue that the majority of its flight path takes place in air space and should, therefore, be subjected to air law. A third option might be to apply air law to the vehicle while in air space and space law when it enters outer space.⁸⁹

84 For a discussion of the spatialist approach, see Luboš Perek, "Scientific Criteria for the Delimitation of Outer Space" (1977) 5:1&2 J Space L 111.

85 For a discussion of the functionalist approach, see Stephen Gorove, "Aerospace Object – Legal and Policy Issues for Air and Space Law" (1997) 25:2 J Space L 101.

86 Hobe *et al.*, *supra* note 11 at 31; IHPH Diederiks-Verschoor & Vladimir Kopal, *An Introduction to Space Law*, 3rd ed (The Hague: Kluwer Law International, 2008) at 17; Lyall & Larsen, *supra* note 25 at 167–68.

87 Diederiks-Verschoor & Kopal, *supra* note 86 at 17; Lyall & Larsen, *supra* note 25 at 166–69.

88 Diederiks-Verschoor & Kopal, *supra* note 86 at 18–20; Lyall & Larsen, *supra* note 25 at 169–70.

89 For more detailed discussion of the delimitation of space see, in addition to the works cited above, Eilene Galloway, "The Definition of Outer Space", in (1968) *Proceedings of the 10th Colloquium of Outer Space* 268; Vladimir Kopal, "What is 'Outer Space' in Astronautics and Space Law", in (1968) *Proceedings of the 10th Colloquium of Outer Space* 275; Gennady P. Zhukov, "The Problem of the Definition of Outer Space", in (1968) *Proceedings of the 10th Colloquium of Outer Space* 271; Vladimir Kopal, "The Question of Defining Outer Space" (1980) 8 Journal of Space Law 154; Bin Cheng (1983) "The Legal Status of Outer Space and Relevant Issues: Delimitation of Outer Space and Definition of Peaceful Use", 11 Journal of Space Law 89; Oscar Fernandez-Brital (1995) "UNCOPUOS Legal Subcommittee March–April 1993 Meeting and the Limit between Air Space and Outer Space", in *Proceedings of the 37th Colloquium of Outer Space* 244; Robert F.A. Goedhart (1996) *The Never Ending Dispute: Delimitation of Air Space and Outer Space*; Katherine M. Gorove (2000) "Delimitation of Outer Space and the Aerospace Object – Where is the Law", 28 Journal of Space Law 11.

3 *The jurisdiction of ICAO*

Related to the question of whether space law applies to suborbital spaceplanes is whether the International Civil Aviation Organization (ICAO) has jurisdiction to govern the operation of these vehicles. ICAO is a specialized UN agency concerned with international civil aviation. The primary source of public international air law is the Chicago Convention that established ICAO.⁹⁰ The Convention only applies to civil “aircraft”.⁹¹ However, the Convention does not define the term “aircraft”. The term is defined in the Annexes to the Convention as “[a]ny machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth’s surface”.⁹² Some commentators have noted that the mere fact that a spaceplane, which would otherwise satisfy the definition of “aircraft” under the Chicago Convention, briefly enters space does not prevent the application of the Chicago Convention and other instruments of air law.⁹³ Even if suborbital spacecraft do not come within the definition of “aircraft”, the argument can be made that ICAO still has jurisdiction over suborbital spaceflight to the degree necessary to ensure the safety of international civil aviation, as is the stated purpose of the Chicago Convention.⁹⁴ Such regulation could, at a minimum, require the incorporation of suborbital flights in the international air traffic management system. If suborbital spacecraft does fall within the jurisdiction of ICAO, then ICAO would have the authority to issue Standards and Recommended Practices (SARPs) to be implemented by ICAO member states. ICAO has formed a “learning group” of industry leaders, academics, and other stakeholders to explore the possible involvement of the organization in the suborbital industry.⁹⁵ However, as this book goes to print, this project remains in its early stages.

B. Domestic regulation of human space flight

While the question regarding the application of international air and space law continues to be debated, states have undertaken efforts to develop domestic regulatory regimes to govern suborbital spaceflight. Although the US was the first state to issue regulations on the subject, other states, including the UK, Spain, Sweden, Belgium, and Curaçao, have also undertaken various initiatives with the purpose of developing a regulatory regime for human spaceflight. It should be mentioned that the European Aviation Safety Agency explored the creation of harmonized regulations to apply across the European Union (EU). Those efforts, however, have

⁹⁰ *Convention on International Civil Aviation*, 7 December 1944, 15 UNTS 295, Can TS 1944 No. 36, ICAO Doc 7300/9 [*Chicago Convention*].

⁹¹ *Ibid.*, art 3(a).

⁹² See ICAO (2010) 9 International Standards and Recommended Practices: Annex 6 to the Convention on International Civil Aviation: Part I, International Commercial Air Transport – Aeroplanes, at c 1. For a summary of the Annexes to the Chicago Convention, see ICAO, *The Convention on International Civil Aviation: Annexes 1 to 18*, online: ICAO www.icao.int/Documents/annexes_booklet.pdf.

⁹³ Rafael Moro-Aguilar, “National Regulation of Private Suborbital Flights: A Fresh View” (2015) 10 FIU L. R. 679. 683–684. Regarding ICAO’s potential jurisdiction over suborbital spacecraft, see generally Paul Stephen Dempsey & Michael C Mineiro, “The ICAO’s Legal Authority to Regulate Aerospace Vehicles” in Joseph N Pelton & Ram S. Jakhu, eds, *Space Safety Regulations and Standards* (New York: Elsevier, 2010) 245.

⁹⁴ Dempsey & Mineiro, *supra* note 93 at 246–47.

⁹⁵ Notes of the Author from the October 21, 2015 meeting of the FAA Commercial Space Transportation Advisory Committee.

stalled – leaving the individual member states of the EU to develop their own domestic regulations.⁹⁶

The FAA's Human Space Flight Requirements require that a license be procured by a space vehicle operator intending to launch (or re-enter) a vehicle containing passengers (or "space flight participants").⁹⁷ In order to obtain the license and commence launch activity, the operator must comply with a number of provisions contained in the FAA Requirements. These requirements include: (i) showing financial responsibility; (ii) obtaining reciprocal waivers of claims; (iii) complying with certain minimum operational requirements; (iv) crew training; (v) fully disclosing the risks of flight to prospective space flight participants; and (vi) obtaining the informed written consent of space flight participants.⁹⁸

The UK Civil Aviation Authority (CAA) issued a report in 2014 that recommends a temporary regulatory approach to govern suborbital flights in the UK.⁹⁹ The report recommends an approach that is in effect very similar to the licensing regime adopted in the US. While the UK CAA determined that suborbital spaceplanes would likely come within the definition of "aircraft" under the Chicago Convention and would, therefore, be subject to existing air law, the proposals for the application of such law resulted in an overall system that resembles the US regime.¹⁰⁰ For example, spaceplanes would be deemed "experimental aircraft", which would exempt them from many of the onerous regulations that otherwise apply to civil aircraft in the UK.¹⁰¹ While such a designation would typically prevent the transport of private passengers, the report urged that an exception be made to that rule so that paying passengers could be flown on the spaceplanes.¹⁰² Finally, the requirement of "informed consent" of the passengers (the core principle of the US regime) was also adopted in the report.¹⁰³

The Spanish legislature is also considering a bill for the creation of a licensing process for suborbital spaceflight, which is strongly influenced by the US model.¹⁰⁴ Like the FAA regulations, the Spanish proposal allows for the issuance of a launch license upon the showing of compliance with environmental and financial responsibility requirements, and requires the informed consent of all passengers.¹⁰⁵

⁹⁶ Moro-Aguilar, *supra* note 93.

⁹⁷ Regarding the Human Space Flight Requirements, see [section V.A.1, above](#). For a general description of the Human Space Flight Requirements, see Tracey Knutson, "What is "Informed Consent" For Space-Flight Participants in the Soon-To-Launch Space Tourism Industry?" (2007) 33:1 J Space L 105. See also Stephan Hobe, "Legal Aspects of Space Tourism" (2007–2008) 86:2 Neb L Rev 439.

⁹⁸ 14 CFR Parts 401, 415, 431, 435, 440, 460 (2012).

⁹⁹ See UK, Civil Aviation Authority, *UK Government Review of Commercial Spaceplane Certification and Operations* (Technical Report, CAP 1189) (July 2014), online: GOV.UK www.gov.uk/government/uploads/system/uploads/attachment_data/file/329758/spaceplanes-tech.pdf; UK, Civil Aviation Authority, *UK Government Review of Commercial Spaceplane Certification and Operations* (Summary & conclusions, CAP 1198) (July 2014), online: GOV.UK www.caa.co.uk/docs/33/CAP1198_spaceplane_certification_and_operations_summary.pdf [UK Government Review: Summary].

¹⁰⁰ UK Government Review: Summary, *supra* note 99 at 33.

¹⁰¹ Ibid.

¹⁰² Ibid. at 34.

¹⁰³ Ibid. at 40.

¹⁰⁴ Although the draft bill was not publicly available at time of this publication, a description of the bill can be found in Moro-Aguilar, *supra* note 93.

¹⁰⁵ Ibid.

Although a bill has not yet been produced in Sweden, a Memorandum of Understanding was signed in 2007 by Spaceport Sweden and Virgin Galactic, which called for Sweden to develop a regulatory regime that drew on the FAA Human Space Flight Requirements.¹⁰⁶ Curaçao has also embarked on the drafting of a national space law that would accommodate suborbital spaceflight as it prepares to provide the spaceport for commercial flights of XCOR's Lynx spacecraft. As with the UK and Spain, Curaçao has chosen to follow the US model of licensure.¹⁰⁷ In contrast, Belgium has pursued a different path than the aforementioned states in its approach to suborbital flight by deciding to simply treat suborbital spaceplanes as aircraft subject to all of the rules and regulations that govern civil aircraft.¹⁰⁸

VII Conclusion

As illustrated in this chapter, the issue of the legal status of spacecraft provides a number of difficult questions. Many of these questions arise from the supra-national nature of space travel, the lack of clarity between the border separating air and space law, and the complexity of multinational space ventures. Long-standing concepts of international space law regarding jurisdiction and other issues served well for many years while space activity remained solely in the governmental sphere. However, the growth of private space activity and the evolution of new technologies, such as the spaceplanes being developed by space tourism companies, have raised new legal issues and brought the adequacy of certain aspects of the existing space treaties into question. In response to these new challenges, laws are being drafted and discussions at many levels continue in order to resolve legal uncertainty and pave the way for a new era of private space flight.

¹⁰⁶ Peter B de Selding & Tariq Malik, "Virgin, Swedish Spaceport Sign Deal for Suborbital Flights", *Space News* (7 February 2007), online: Space News spacenews.com/virgin-swedish-spaceport-sign-deal-suborbital-flights.

¹⁰⁷ Moro-Aguilar, *supra* note 90. See also Frans G von der Dunk, "Mixing US and Dutch Approaches: Towards Curaçao's Legislation on Private Commercial Spaceflight" (2013) 62:4 ZLW 740.

¹⁰⁸ *Law on the Activities of Launching, Flight Operations or Guidance of Space Objects* (Belgium), online: Belgian Science Policy Office www.belspo.be/belspo/space/doc/beLaw/Loi_en.pdf.